Applicants	Wang et al.	**COMMUNICATION REGARDING CERTIFICATE OF CORRECTION**
Patent No.	6,822,548	
Issue Date	11/23/2004	
Serial No.	10/786,533	
Attorney Docket No.	125.021US02	
Title: MAGNETIC THIN FILM INDUCTORS		

ATTN: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Applicants hereby requests issuance of a Certificate of Correction in U.S. Letters Patent No. 6,822,548 as specified on the attached Certificate (Form PTO/SB/44). Please find enclosed documentation supporting errors identified in the above noted patent, referred to herein as Exhibits A and B.

With respect to the error identified in claim 5 of the issued patent, Exhibit A is a copy of pages 11 and 12 of the original specification and a signed transmittal form in compliance with 37 CFR 1.10 indicating filing of the application with the U.S. Patent & Trademark Office on February 25, 2004. Exhibit B is a copy of Cols. 5 and 6 of the issued patent. The identified error constitutes a typographical error and as such, does not introduce new matter.

Applicants believe this correction as specified is necessary due to an Office error and do not believe that any fee is due for requesting a Certificate of Correction for this patent. However, if deemed necessary, the Office is authorized to charge any additional fees found due to Deposit Account No. 502432. Please contact the undersigned if you have any questions.

Respectfully submitted,

Date: December 14, 2007

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Enclosures

908 selectively positioned. Each magnetic material section **904**, **906** and **908** is encased around portions of the conducting member **902** wherein current flows in the same direction. Although, FIG. **7** only shows the conducting member as being formed in two turns, it will be understood that more than two turns could be formed depending on the amount of inductance desired and that the present invention is not limited to two turns. In another embodiment of a spiral rectangular inductor **1000**, sections of magnetic material **1004**, **1006** and **1008** are further partitioned into smaller sections. This is illustrated in FIG. **8**. By further sectioning the magnetic material **1004**, **1006** and **1008** eddy currents are further reduced. As illustrated in FIG. **8**, the conductors **1002** provide substantially parallel current paths in which current (i) flows in substantially uniform directions where the conductors are encased by the sections of magnetic material **1004**, **1006** and **1008**.

Referring to FIG. **9**, a square spiral inductor **1100** of one embodiment of the present invention is disclosed. This embodiment includes a conducting member **1102** having two turns and four sections of magnetic material **1104**, **1106**, **1108** and **1110** encasing relatively parallel sections of the conducting member **1102**. Although not shown, the sections of magnetic material **1104**, **1106**, **1108** and **1110** can each be further sectioned to further reduce the eddy currents, similar to what was illustrated in FIG. **8**. Moreover, the number of turns can vary to achieve a desired inductance.

The embodiments of the present invention can also be applied to other shapes. For example, a circular embodiment of a spiral inductor **1200** is illustrated in FIG. **10**. In this embodiment, pie shaped sections of magnetic material **1204** selectively encase conductive member **1202**. As with the other embodiments of the present inventions, in this embodiment each section of magnetic material **1204** encases a section of the conductive member **1202** wherein current is flowing in a substantially uniform direction. Another example of an embodiment of an inductor **1300** is an octagon shape as illustrated in FIG. **11**. In this embodiment, pie shaped sections of magnetic material **1304** selectively encase sections of conductive member **1302**.

Moreover, the present invention can be applied to other shapes including generally regular polygonal shapes such as square, octagonal, hexagonal and circular. In addition, embodiments of the present invention can be applied to arbitrary shapes. For example, referring to FIG. **12**, yet another embodiment of an inductor **1400** of the present invention is illustrated. In this embodiment, sections of magnetic material **1404** are selectively positioned to encase sections of conducting member **1402** that are positioned in an arbitrary shape. As with the previous embodiments of the present invention, each magnetic material section **1404** is selectively placed so it encases sections of the conducting member **1400** wherein current in the conducting member **1402** travels in a substantially uniform direction. Moreover, as with the previous embodiments, edges of each section of the magnetic material in which the conducting member **1402** enters and exits are generally perpendicular to a path of the conducting member **1402**.

In forming embodiments of the present invention, layers of magnetic material are first deposited and then patterned to encase selected portions of the conducting members. In each of the embodiments of an inductor in a spiral formation, a central opening in the layers of magnetic material is formed. This is illustrated in FIGS. **6-12**. For example, the conducting member **1402** of FIG. **12** encircles the central opening **1406**. This design allows each section of magnetic material **1404** to encase only a portion of the conducting member **1402** in which current is flowing in relatively the same direction.

The embodiments of the present invention as illustrated in FIGS. **1-12** can employ different types of magnetic material. For example, embodiments of the present invention use soft magnetic materials such as FeNi, FeSiAI and CoNbZr. However, inductors with relatively high ferromagnetic frequency can be achieved in the embodiments of the present invention using magnetic thin films having nano particles that form high resisitivity. Examples of magnetic thin films with high resistivity are FeBN, FeBO, FeBC, FeCoBF, FeSiO, FeHfO, FeCoSiBO, FeSmO, FeAlBO, FeSmBO, FeCoSmO, FeZrO, FeNdO, FeYO, FeMgO, CoFeHfO, CoFeSiN, CoAlO, CoAlPdO, CoFeAlO, CoYO, FeAlO and CoFeBSiO. A typical magnetic film thickness for the present invention is around 0.1 to 1.5 micrometers and a typical insulator thickness is about 1 micrometer. As stated above, some embodiments of the present invention use a combination of layers of different magnetic material to form a finished magnetic layer having desired properties.

In addition, embodiments of the present invention use nano particles of Fe that are introduced into a matrix of Al_2O_3 to form the magnetic material. The nano particles create higher resistivity which helps to reduce eddy currents. Moreover, with the use of the FeAlO, experiments have shown a ferromagnetic resonance frequency of approximately 9.5 GHz for a thin film thickness (the thickness of the magnetic material) of about 0.15 micometers can be achieved. In addition, the total length of the spiral embodiments is approximately 1 mm. The ferromagnetic resonance frequency of this embodiment as well as the physical length of this embodiment is within the range desired for wireless communication applications.

Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement, which is calculated to achieve the same purpose, may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention. Therefore, it is manifestly intended that this invention be limited only by the claims and the equivalents thereof.

What is claimed is:

1. A magnetic thin film inductor comprising:

a plurality of elongated conducting regions positioned parallel with each other and at a selected spaced distance apart from each other; and

magnetic material encasing the plurality of conducting regions, wherein when currents are applied to the conducting regions, current paths in each of the conducting regions cause the currents to generally flow in the same direction to enhance mutual inductance.

2. The magnetic thin film inductor of claim **1**, wherein the magnetic material further has cutout sections to reduce eddy currents.

3. The magnetic thin film inductor of claim **1**, further comprising:

an insulating layer for each conducting region, the insulating layer is positioned between an associated conducting region and the magnetic material.

4. The magnetic thin film inductor of claim **1**, wherein the magnetic material is made from layers of different magnetic material.

5. The magnetic thin film inductor of claim **1**, wherein the magnetic material is made from the group consisting of, FeAlO, FeBN, FeBO, FeBC, FeCoBF, FeSiO, FeHfO, FeCoSiBO, FeSmO, FeAlBO, FeSmBO, FeCoSmBO, FeZrO, FeNdO, FeYO, FeMgO, CoFeHfO, CoFeSiN, CoAlO, CoAlPdO, CoFeAlO, CoYO and CoFeBSiO.

What is claimed is:

1. A magnetic thin film inductor comprising:

a plurality of elongated conducting regions positioned parallel with each other and at a selected spaced distance apart from each other; and

magnetic material encasing the plurality of conducting regions, wherein when currents are applied to the conducting regions, current paths in each of the conducting regions cause the currents to generally flow in the same direction to enhance mutual inductance.

2. The magnetic thin film inductor of claim 1, wherein the magnetic material further has cutout sections to reduce eddy currents.

3. The magnetic thin film inductor of claim 1, further comprising:

an insulating layer for each conducting region, the insulating layer is positioned between an associated conducting region and the magnetic material.

4. The magnetic thin film inductor of claim 1, wherein the magnetic material is made from layers of different magnetic material.

5. The magnetic thin film inductor of claim 1, wherein the magnetic material is made from the group consisting of, FeAlO, FeBN, FeBO, FeBC, FeCoBF, FeSiO, FeHfO, FeCoSiBO, FeSmO, FeAlBO, FeSmBO, FeCoSmO, FeZrO, FeNdO, FeYO, FeMgO, CoFeHfO, CoFeSiN, CoAlO, CoAlPdO, CoFeAlO, CoYO and CoFeBSiO.

6. The magnetic thin film inductor of claim 5, wherein the thickness of the magnetic material is in a range of about 0.1 to 1.5 micrometers.

7. A magnetic film inductor comprising:

two or more conductive member positioned parallel to each other;

magnetic material encasing the two or more conductive members along at least one relatively straight path of the two or more conductive members, wherein current flowing through the two or more conductive members in the same direction enhance mutual inductance of the magnetic film inductor.

8. The magnetic film of claim 7, wherein the magnetic material along at least one relatively straight path has at least one cutout section to prevent eddy currents.

9. The magnetic film of claim 7, further comprising:

an insulating layer formed between each conducting member and the magnetic material.

10. The magnetic film of claim 7, wherein the magnetic material is made from the group consisting of, FeAlO, FeBN, FeBO, FeBC, FeCoBF, FeSiO, FeHfO, FeCoSiBO, FeSmO, FeAlBO, FeSmBO, FeCoSmO, FeZrO, FeNdO, FeYO, FeMgO, CoFeHfO, CoFeSiN, CoAlO, CoAlPdO, CoFeAlO, CoYO and CoFeBSiO.

11. The magnetic thin film inductor of claim 10, wherein the thickness of the magnetic material is in a range of about 0.1 to 1.5 micrometers.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

EXHIBIT A

Applicant(s): Xingwu Wang et al.

Docket No.: 125.021US02

Title: MAGNETIC THIN FILM INDUCTORS

MAIL STOP PATENT APPLICATION
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

We are transmitting herewith the following attached items and information (as indicated with an "X"):
X **DIVISIONAL** of prior Patent Application No. 10/014,045, filed December 11, 2001, (under 37 C.F.R. § 1.53(b)) comprising:
X Specification (13 pgs. including 11 claims and 1 pg Abstract).
X Formal Drawings (7 sheets).
X Information Disclosure Statement (1 pg.) and Form 1449 (2 pgs.).
X Preliminary Amendment (1 pg.).
X Copy of signed Declaration and Power of Attorney (3 pgs.) from prior application.
X Incorporation by Reference: *The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied herewith, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.*
X Form PTO-2038 (Credit Card Payment Form) (1 pg.) (For the application filing fee as set forth below.
X Prior Application is assigned of record to Intersil Americas Inc.
X Return postcard.

The filing fee has been calculated below as follows:

APPLICATION FILING FEE					
	Number of Claims Filed (1)	Claims Included in Basic Filing Fee (2)	Number of Extra Claims (1-2)	Cost per Extra Claim	Fee Required
Total Claims	11	- 20 =	0	x $18 =	$ 0
Independent Claims	2	- 3 =	0	x $86 =	$ 0
One or More Multiple Dependent Claims Presented					$ 0
Basic Filing Fee					$ 770
Total Application Filing Fee					**$770**

Please charge any additional required fees or credit overpayment to Deposit Account No. 502432.

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"Express Mail" mailing label number: EV385201454US **Date of Deposit: February 25, 2004**
These papers and fees are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and addressed to the Commissioner for Patents, Mail Stop Patent Application, P.O. Box 1450, Alexandria, VA 22313-1450.

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